ISO focus
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The food journey

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#129

ISO focus

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buzz

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Rising to the agri-food **CHALLENGE**

***Olivier Peyrat**, Director-General of AFNOR Group.*

"From farm to fork." France, together with Brazil, has been overseeing the activities of ISO/TC 34, the international technical committee for the agri-food industry, since 2008. Its mandate covers the entire sector, from producer to consumer. The committee has gained importance over the years. Nearly 140 countries are involved in its work, resulting in a portfolio of more than 840 published documents. These revolve around two main areas of concern.

The first is food safety. To help provide quality products that are safe for consumers to eat, the international test methods these documents propose aim to establish uniform practices for detecting contamination, optimizing food controls and ensuring fair trade. ISO 22000 on food safety management will help companies identify and control hazards associated with their activities. The new version of the standard now incorporates all the recent changes to reference standards ISO 9001 (quality management) and ISO 14001 (environmental management).

The second priority area is food quality. This involves specifying what a product is (e.g. giving a description of saffron) or listing its components (for example, vitamin A levels in baby formula).

Societal issues have assumed greater prominence on the committee's work agenda in recent years. They even featured at the heart of discussions at the États généraux de l'alimentation, a gathering of stakeholders concerned with the quality and safety of food, held in France in 2017. A study conducted around the same time by the INC, the French National Institute for Consumer Affairs, provides an in-depth analysis of consumer expectations, sketching a rough picture of what agriculture will look like tomorrow. The main topics included the impact of food on health, human-animal relations and food prices. Still in their infancy, other issues such as sustainable food and digital technology should start to materialize soon.

Reflecting deeper trends, these concerns are giving those involved in voluntary standardization plenty to think about. Some of these topics have already been addressed, such as in the technical specification on animal welfare that was published recently. Drafted in association with the World Organisation for Animal Health (OIE), it is intended for use by the food industry and serves as a reference in welfare management for food-producing animals. Meanwhile, a standard on sustainable cocoa is also in development, based on fair trade practices. It will apply both to cocoa-producing countries, such as Côte d'Ivoire and Ghana, and to consumer countries. Another good example is the work being done to adapt ISO 26000 on social responsibility to the world of agriculture.

The agri-food sector is defined by its cross-disciplinary nature. There isn't a single field of activity or a single individual that is not in some way affected by food. Its ubiquitous nature is creating many specific needs. A case in point is senior citizens, whose special status was the subject of an AFNOR report on the Silver Economy in 2015. Although not within the remit of ISO/TC 34, diseases of the elderly (such as diabetes, food intolerances and allergies) require the development of clear information on consumer products by professionals of the sector. Equally essential, food manufacturers need to take into account swallowing disorders that often affect the elderly. Thus, adapting the texture or composition of foods must rank among the many areas of focus for voluntary standardization, to support the sector's development and the increasing median age of part of the world's population. Thanks to ISO, the world will become safer, more prosperous and more united – in short, a more harmonious place.

Embedded at the very core of society, the agri-food industry represents, now more than ever, a challenge for the future of global proportions. In the technical committee, we welcome the growing interest of representatives from Africa and Asia (particularly China). Bringing a broad spectrum of players to the (standardization) table means the texts that we draft are representative of each party, be they manufacturers, distributors or consumer organizations, working alongside highly committed government and inspection bodies. Together, we can create standards that continue to support trade while responding to tomorrow's social and environmental challenges. ■

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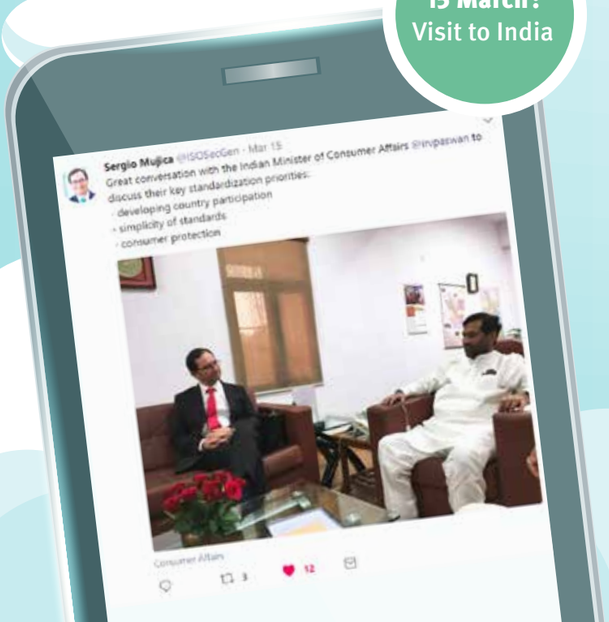

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Visit to Malaysia

29 January:
Visit to Austria

7 December:
Visit to China

food

and the post-2015 development agenda

by Clare Naden

When 193 governments came together to agree a common framework to tackle 17 major world issues by 2030, standards were seen as critical to help achieve the United Nations agenda for sustainable development. With over 1 600 standards for the food production sector alone, ISO certainly has the means. But which standards are most relevant, and what kind of benefits – if any – can the food industry expect?

The food industry has a unique opportunity to embrace the SDG agenda.

We live in a world where nearly two billion people are overweight or obese, yet more than 800 million go hungry. Add to that a growing population that is tipped to reach 9.7 billion in 2050 – that's two billion more mouths to feed – and it's clear that safe, sustainable and nutritious food production and distribution are one of our greatest challenges.

Feeding the world is, unsurprisingly, a key ingredient of the United Nations 2030 Agenda, whose Sustainable Development Goals (SDGs) include a major pillar about ending hunger and poverty everywhere. Standardization can play a significant part in this effort, which is why ISO's largest technical committee in the field of food has taken the initiative to place the 2030 Agenda goals at the heart of its work.

Destination "zero hunger"

"How close are we to zero hunger?" asks a report by the Food and Agriculture Organization of the United Nations (FAO) on the state of food security and nutrition in the world. Not very, it seems, judging by the number of undernourished people, which has risen from 777 million in 2015 to 815 million in 2016. At the same time, worldwide obesity has tripled since 1975[1]. Ensuring food is sustainably produced in the right areas of the globe, therefore, is no easy task.

FAO is the custodian agency designated to monitor indicators across six of the 17 SDGs – namely, Goals 2, 5, 6, 12, 14 and 15. Covering areas such as eliminating hunger, building food security and a sustainable agricultural system, access to water and sanitation, sustainable production and consumption, and protecting forests and oceans, these six goals are among the key SDGs for food companies. In addition, SDG 3 "to ensure healthy lives and promote well-being for all at all ages" is hugely relevant for food companies.

There are four other development goals equally significant to the agro-industry. SDG 9, for example, pertains to infrastructure, sustainable industrialization and innovation, while SDG 13 supports climate change action. Meanwhile, SDG 8 covers sustainable economic growth and full employment and SDG 17 calls for strengthening partnerships in pursuit of global sustainability.

Amid its extensive portfolio of International Standards, which contains globally recognized tools to help governments, industry and consumers contribute to all the SDGs, ISO boasts over 1600 standards for the food production sector alone, designed to create confidence in food products and improve agricultural methods. Add to that those standards that help organizations manage their environmental impact, promote sustainable and ethical purchasing decisions and reduce waste, and it's no wonder ISO technical committees are starting to map their work against the United Nations SDGs to see how they might contribute even more.

1) WHO, Obesity and overweight factsheet (October 2017): **www.who.int/en/news-room/fact-sheets/detail/obesity-and-overweight**

ISO boasts over 1600 standards for the food production sector alone.

Partners in development

Leading the way is one of ISO's oldest technical committees: ISO/TC 34 on food products. Since its inception in 1947, ISO/TC 34 has published nearly 850 standards – with another 120 in development – covering human and animal foodstuffs from farm to fork. It consists of 19 different subcommittees and working groups focusing on everything from food products and animal feeding stuffs to safety, vitamins and microbiology. The team of 307 experts from 138 countries is responsible for ISO's flagship family of standards – the ISO 22000 series on food safety management – which provides guidelines and best practice for managing risks in all areas of food production.

Sandrine Espeillac, Secretary of ISO/TC 34, says an invitation by Codex Alimentarius to participate in a panel at one of their events last year was the catalyst for the technical committee to take a closer look at how food-related standards contribute to the SDGs and develop an initiative within the committee to see what more can be done to align future standards on the 2030 Agenda. Often referred to as the "Food Code", the Codex Alimentarius can safely claim to be the most important international reference point in matters concerning food quality.

"The event was about the partnerships between Codex and international organizations for sustainable development," Sandrine Espeillac explains. "I sat on a panel that discussed how we could all work together to contribute to the implementation of the 2030 Agenda for Sustainable Development. It was clear that many of our standards already do so directly – although the link wasn't always made – and that there were also some gaps where standardization could contribute even further."
This spurred the committee to embark on a project to correctly map current standards to the SDGs and to develop an entirely new technical specification that focuses directly on how the agri-food sector can offer its contribution.

The big disconnect

Social responsibility is one area where the link must be made more obvious. While there is increased awareness that businesses can indeed become a force for good in society and the world, companies still tend to use the SDGs as an indicator to showcase how existing business activities contribute to the 17 global goals. And the food industry is no exception. This further accentuates the "big disconnect" between business doing good while the state of the world is deteriorating.
To achieve the full potential of the SDGs for business, we must embed true sustainability into corporate strategy, and International Standards offer the chance to do just that. Take, for instance, the future ISO/TS 26030. ISO/TC 34 is working on a food-sector application of one of the world's most referenced standards for social responsibility – ISO 26000.
The much awaited technical specification will give guidance on how to integrate the core issues of social responsibility in the food chain, which should serve to harmonize the different approaches at an international level. Its objectives include contributing to the SDGs by providing recommendations to businesses and organizations on how they can operate in an ethical and transparent way that contributes to sustainable development.

The example of cocoa

Standards already in development that have been identified as being easily linked to the SDGs include the ISO 34101 series on sustainable and traceable cocoa. Cocoa is an industry of relevance to the SDGs as it is predominantly a smallholder activity in developing countries. A labour-intensive crop, it often produces low yields, making it difficult for farmers to be economically viable.
Although there are a number of initiatives in place to help make cocoa farming more sustainable, there remains a strong need for harmonization to achieve uniform procedures and consensus on what sustainability in this sector really means and how those initiatives can truly serve farmers' needs.
Due out as a multi-part series later this year, ISO 34101, *Sustainable and traceable cocoa*, takes a stepwise approach to sustainable cocoa bean production and specifies requirements for a management system, product traceability and improved performance. Featuring a dynamic farm development plan, it aims to implement good agricultural practices, protect the environment, and improve the social conditions and livelihoods of farmers. This has the potential to make cocoa farming more attractive to young people, which is important as the average age of farmers has risen rapidly in the main cocoa-producing regions over the last few decades.
Another ISO/TC 34 deliverable identified as being directly aligned with the SDGs is technical specification ISO/TS 34700 for animal welfare management. It helps organizations in the food and feed industry develop an animal welfare plan that is aligned with the principles of the World Organisation for Animal Health (OIE) Terrestrial Animal Health Code (TAHC) and ensures the welfare of farm animals across the supply chain.

Safe, sustainable and nutritious food production and distribution are one of our greatest challenges.

Top of mind

As more standards are identified throughout the year and mapped to the SDGs, ISO/TC 34 will have the chance to promote the benefits of food standards, which should encourage broader uptake and further contribute to the SDGs.
But work doesn't stop there. "This really is just the tip of the iceberg," says Sandrine Espeillac. "Now that the SDGs are a key part of our business plan, they will be top of mind when future standards are proposed and developed. We hope this will contribute to a more sustainable food industry worldwide."
As the custodian of world food security, the food industry has a unique opportunity to embrace the SDG agenda and use it as a driver of business strategies and innovation. To fully support organizations in trying to understand and contribute to the global achievement of the SDGs, new standards will be necessary. And these shall be sharper, more focused and pragmatic, so that we can one day hope to reach the United Nations target of "zero hunger". ■

Taking food safety **to a higher level**

by Ann Brady

Can we trust current food security systems and are they sustainable? Some of the specialists involved in the revision of ISO 22000 explain why the new version of the standard is a timely response, for humans and animals, to the growing global challenges to food safety.

Technology has transformed our lives – from how we live to what we eat. Indeed, technology has transformed global food production, lifting people around the world out of poverty and starvation. That is the good news. The not so good news is that the use of fertilisers, agrochemicals and sophisticated irrigation techniques has resulted in a growing dependence globally on high-yielding crops, such as wheat, maize and rice, leaving us vulnerable to any failure in their supply chains. More than seven billion people rely on these crops and with the United Nations projecting that figure to reach 9.8 billion in 2050, the pressure on our food systems will also grow. According to Prof. Sayed Azam-Ali, CEO of Crops for the Future, demand for food and animal feed is set to at least double over the next three decades. As we go deeper into the era of the so-called Fourth Industrial Revolution, we will need to leverage its new technologies – such as drones, artificial intelligence, robotics – to feed the world in a sustainable and affordable way and protect the planet's natural resources.

Food safety in the balance

The issue made it on to the menu at Davos. In a special session at the World Economic Forum Annual Meeting 2018, leaders from the food and agricultural industry, government, civil society, and meat and food technology companies recognized the triple pressures of rising middle-class demand, health issues linked to both under- and over-consumption of meat and protein around the world, and environmental sustainability, which requires changes to the global system of meat and protein production.

On the back of this, a new initiative was launched to shape the agenda for global meat and protein production to ensure a range of universally accessible, safe, affordable and sustainable meat and protein options to meet tomorrow's demand.

Big business has been paying attention. IKEA, for instance, has been experimenting with sustainable food of the future – insects. The flatpack giant's test kitchen in Copenhagen has been cooking up bug burgers – a recipe that combines beetroot, parsnips and mealworms – and algae-based hotdogs. The facts stand up: insects can help to take the pressure off overused food systems. And the animal feed industry can also benefit. From next year, the European Union is expected to allow insects to be used to make livestock food for poultry and pigs.

The need for food security is greater than ever. An outbreak of *E. coli* in the United States in April this year, for example, was linked to bags of romaine lettuce, according to the Centers for Disease Control and Prevention, the country's leading public health institute. *The New York Times* reported that nearly 70 % of people who were unfortunate enough to be infected were hospitalized with a toxin-producing strain of *E. coli*, and several developed kidney failure. And recent research at Queen's University Belfast indicated that nitrates used in the curing process for processed meats can produce chemicals that cause an increased risk of colorectal cancer.

Add to the above an ever more complex food supply chain, a burgeoning global population, and the consequent strain on the world's already stretched resources, and it's not hard to see why the challenges to global food security and safety are causing concern and why leaders from all sectors are looking for solutions.

Meeting requirements

So how can we ensure a systematic way for food manufacturers to produce safe food for humans and animals? One such solution to help inspire confidence is ISO 22000, *Food safety management systems – Requirements for any organization in the food chain*. As we have seen, there have been many food safety challenges for users along the supply chain since the International Standard was first published in 2005, prompting the need for a revision.

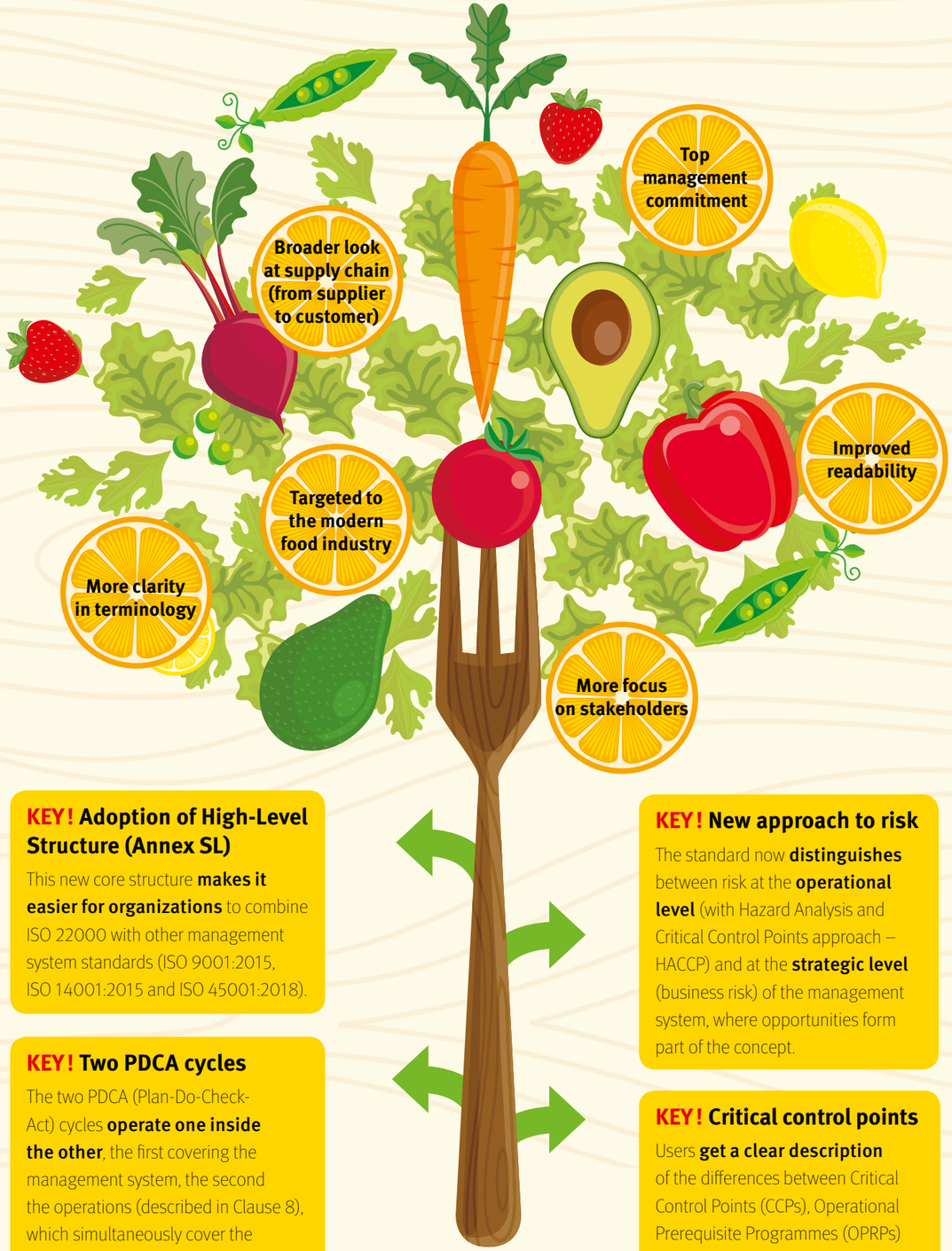
One such solution to help inspire confidence is ISO 22000.

Jacob Faergemand, Chair of technical committee ISO/TC 34, *Food products*, subcommittee SC 17, *Management systems for food safety*, and CEO of Bureau Veritas Nordic, an international certification agency, explains the major changes to the standard, which include modifications to its structure as well as clarifying key concepts. He says: "To meet the market needs for food safety, ISO 22000 is created by stakeholders who are involved in food safety organizations: governance, consumers, consulting, industry and research. When a food safety management system is developed by the users of ISO 22000, you make sure that requirements from the market are met."

Faergemand cites the ISO 22000:2018 connection to Codex Alimentarius, a United Nations food group that develops guidelines for governments, as an important example of meeting market needs. "Due to Codex status and reference in national law, ISO 22000:2018 has maintained a strong link to Codex standards, which enables governments around the world to refer to ISO 22000:2018 in government inspections and as national requirements."

He highlights a specific desire from food safety organizations to have a clear description of the differences between some key definitions – such as Critical Control Points (CCPs) and Operational Prerequisite Programmes (OPRPs) – which maintain alignment with Codex definitions as much as possible. Faergemand admits that it was challenging to find consensus on this important task, "but we have worked very hard and been very dedicated to developing this clear distinction to benefit the users of the standard".

WHAT'S NEW IN **ISO 22000:2018**?



KEY! Adoption of High-Level Structure (Annex SL)

This new core structure **makes it easier for organizations** to combine ISO 22000 with other management system standards (ISO 9001:2015, ISO 14001:2015 and ISO 45001:2018).

KEY! Two PDCA cycles

The two PDCA (Plan-Do-Check-Act) cycles **operate one inside the other**, the first covering the management system, the second the operations (described in Clause 8), which simultaneously cover the HACCP principles.

KEY! New approach to risk

The standard now **distinguishes** between risk at the **operational level** (with Hazard Analysis and Critical Control Points approach – HACCP) and at the **strategic level** (business risk) of the management system, where opportunities form part of the concept.

KEY! Critical control points

Users **get a clear description** of the differences between Critical Control Points (CCPs), Operational Prerequisite Programmes (OPRPs) and Prerequisite Programmes (PRPs).

Big business has been paying attention.

Ready for risk

One significant change to the standard was the introduction of the High-Level Structure (HLS) common to all the ISO management systems standards. As Faergemand explains, "this will benefit the organizations using more than one management system". It also benefits organizations to take a different approach to understanding risk. "As a concept, risk is used in various ways and it is very important for food businesses to distinguish between the well-known hazard assessment on the operational level and the concept of business risk (presented in the new structure), where opportunities also form part of the concept."

The new version of ISO 22000 also clarifies the Plan-Do-Check-Act (PDCA) cycle by having two separate cycles in the standard working together. "The two PDCA circles operate one inside the other – one covering the management system and the other, within it, the operations, which simultaneously cover the principles of HACCP defined by Codex," Faergemand says.

HACCP (Hazard Analysis and Critical Control Points), referred to above, is a system of principles that helps food business operators look at how they handle food and introduces procedures to ensure that the food produced is safe to eat. According to Hanne Benn Thomsen, a Senior Quality System Specialist at Chr. Hansen A/S, a global bioscience company that develops natural solutions for the food, nutritional, pharmaceutical and agricultural industries, the revised ISO 22000 standard goes beyond the "classical" HACCP principles, "increasing the focus on the risk elements when producing a food, to look at the supply chain more broadly".

She believes the strength in ISO 22000 is that it is acknowledged worldwide. "All companies within the food chain, directly as well as indirectly, can be certified against this standard and it is issued by an independent, non-governmental organization. By using this standard, we have a shared food safety language, which is commonly accepted worldwide."

Partners in food

Benn Thomsen says that the new version of ISO 22000, as "a very generic standard", is helping to set the framework for the systems that must be implemented to ensure food safety. Equally important, she adds, "it is also giving food organizations the tools to assess, identify and evaluate food safety hazards and, if an unlikely hazard should occur, how to reduce the impact on consumers as much as possible by being able to gain control of the impacted products".

It is clear that government policy and international cooperation are key – in both the developed and developing markets – to push public-private cooperation on building a portfolio of protein solutions to meet tomorrow's demands in line with the United Nations Sustainable Development Goals (SDGs). The new version of ISO 22000 is playing a key role in helping to meet SDG 17: "Partnerships for the goals".

Paul Besseling of Précon Food Management, and the official liaison officer from SC 17 in Codex Alimentarius, says: "For consumers and society as a whole, it is very important that authorities and businesses are using the same principles and approaches towards food safety. Alignment between laws and business standards must have high priority in food safety policy. The European Union supports the developments in ISO 22000."

He underscores the significance of ISO 22000's alignment with the Codex Alimentarius General Principles of Food Hygiene (GPFH), despite their inherently different roles. He says: "The purpose of the GPFH is to support and harmonize food safety authorities worldwide in creating their laws and subsequent official control or inspections. The purpose of ISO 22000 is to support food-business operators to comply with these laws, to meet customer requirements and to continue and improve their business."

Building trust

Besseling says the new version of the standard has a better focus on external stakeholders of the food business. "This will help operators to understand the risks of unsafe food in terms of their business risk and will strengthen their position in the food supply chain." In turn, for food safety authorities, the alignment is important because "it will support their work and makes their job easier".

And finally, he says, for food-business operators, "it is very important that they can trust that their food safety management systems comply with relevant legislation and, ideally, legislative authorities are confident that food-business operators comply with the legal requirements when using ISO 22000 as their management system". ■

Government policy and international cooperation are key.

Discover how ISO 22000 takes a new approach to food safety management. Here's a snapshot of how it helps.

MY FOOD FACTORY with ISO 22000

Better processes

Dynamic control of food safety hazards through HACCP* and PRPs is a cost-effective way of controlling food safety, from ingredients to production, storage and distribution.**

*HACCP (Hazard Analysis and Critical Control Points) requires that potential hazards are identified and controlled at specific points in the process.

**PRPs (Prerequisite Programmes) stipulate the prerequisites for producing safe food.

Better planning

A clear project plan defines how, when and by whom risks and objectives should be managed.

Better infrastructure

Sites, product flows and factory layouts are arranged logically for satisfactory sanitary conditions.

Better competence

Workers learn good hygiene practices through in-house training programmes.

Better team work

Relationships based on effective communication help employees work towards the same goal of food safety.

Better performance

Management reviews performance and objectives regularly to drive continual improvement.

Better leadership

Management shows commitment to food safety through ensuring policies, resources and actions.

Better documentation

Food safety policies, procedures, work instructions and records are carefully documented for further reference.

Photo : KMC

The key ingredient **in food safety**

As Quality Manager at KMC, the Danish-based food ingredients company, Marianne Dam is responsible for the maintenance and updating of KMC quality systems and certifications. Here, she explains how ISO 22000 is used and the many benefits it brings to food management systems.

With its production sites and headquarters in Denmark, KMC has grown from being a provider of potato starch and potato flakes to a company that also supplies special ingredients to customers around the world. Thanks to innovative food solutions – such as substituting common proteins used in dairy and confectionery with potato starch solutions – the company enables food manufacturers to make cheaper, healthier and less controversial products. As a result, KMC has enjoyed successful growth and, as the company's Quality Manager, Marianne Dam says ISO 22000 plays an important role – indeed an essential one – in its future expansion.

Photo : KMC

***ISOfocus*: What does your company see as the main benefit of having food management systems in place such as ISO 22000?**

Marianne Dam: KMC is an ingredients company and we deliver products to the global food market. We are dependent on having a reliable food management system in place – first of all, because of our responsibility to our customers (typically B2B) when food safety issues arise and, ultimately, because we owe it to our global end users. Our management system helps us to be safe, focused and efficient in our production set-up.
There are clear benefits to having a food management system certified by a third party. These certificates are the first valid evidence of the systems implemented in our company and many of our customers use them as an important part of their supplier approval process. We believe we could not manage our existing business without such recognition.
In general, our management system has given us the opportunity to gather internal expertise within the company with which to formalize procedures, i.e. for optimizing the training and education of all employees; implementing control of record management to ensure the right and most up-to-date information gets to the right people; and improving management's role and communication with the rest of the organization.
These items have been the basis for our business's development from supplier of commodities to purveyor of ingredients for food, pet food and livestock feed customers all over the world. It is interesting to note that today's pet food and livestock feed industry now has the same high demands for raw materials as the food industry.


Photo : KMC

***Marianne Dam**, Quality Manager at KMC.*

What do you think are the biggest challenges ahead in food safety and the corresponding management and certification systems?

The biggest challenge in the future of food safety is the insufficient understanding of the real product combined with the lack of confidence between buyer and supplier in today's complex global market. Communication and the exchange of documentation and goods have become increasingly easy, so much so that many of our customers are demanding manuals that are valid for all raw materials, explaining what to do in case of an "incident".
Unfortunately, as many companies have a huge variety of raw materials, it isn't possible to collate detailed knowledge of each component. Although basic documentation and certification make sense, cooperation and partnership must be the way forward to maintain the focus on food safety, decent products and individual responsibility.

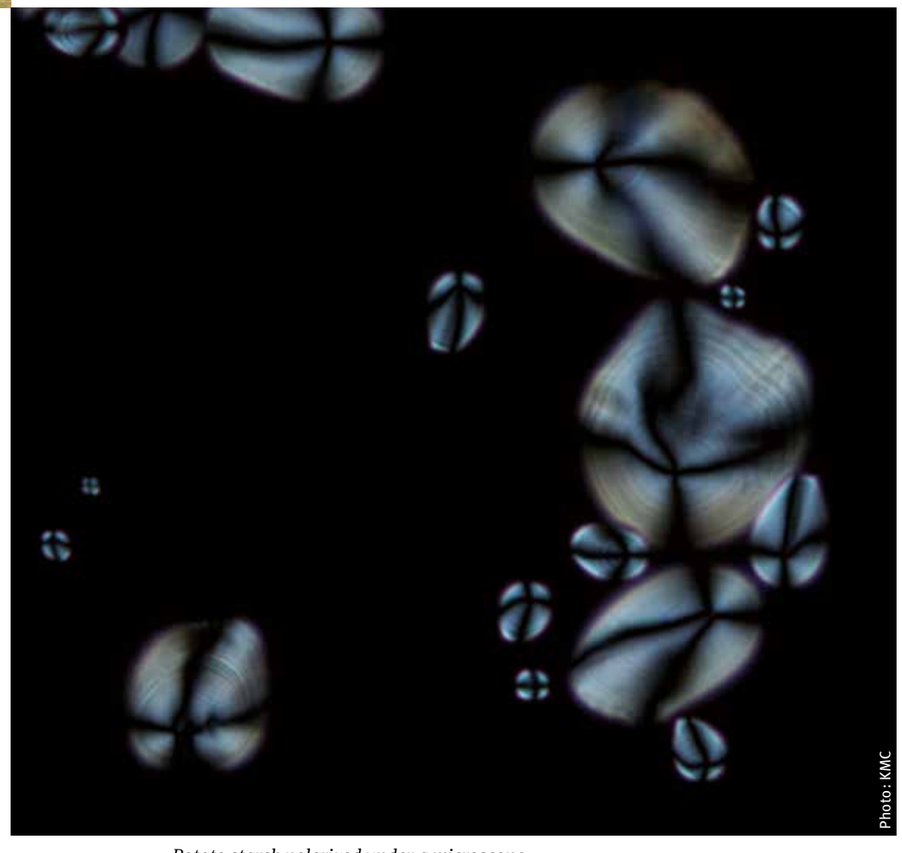


Photo : KMC

Potato starch polarized under a microscope.

Customers expect the basics of product quality and food safety.

ISO has a huge advantage in being internationally known.


Photo : KMC

How can ISO 22000 and the Food Safety System Certification (FSSC) help to address these challenges?

The main advantage of ISO 22000 is that it is a general standard, so its principles can be used for all kinds of food/feed industries dependent on risk assessment thinking. It gives a company responsibility for handling its own production and products based on its own knowledge and experience. Of course, the whole system relies on appropriate documentation and analysis, and third-party auditing ensures that the company lives up to an acceptable level of quality for a modern food industry.

How do standards and the increasing demand for certification, documentation, audits, etc. affect a smaller player in the global food sector?

The demand for certification is becoming increasingly complex and time-consuming. Today, customers expect the basics of product quality and food safety, along with sustainability and ethical trade. There are many standards with different kinds of "owners" and many customers have preferences, which makes it difficult to choose the best and/or the most comprehensive. While larger suppliers can decide for themselves which certifications they want to comply with, there are greater risks involved for small companies.
Pricing is a relevant issue here since somebody needs to cover the cost for the extra administration and documentation. This is an important area of focus for a smaller company. Ensuring business survival can mean daring to say to your customer "can we do this another way?", or simply "no, thanks".

What modifications/improvements would you like to see in ISO 22000 to make it more relevant for your business?

ISO 22000 cannot stand alone due to the general demands from global food customers to have its certifications recognized by the Global Food Safety Initiative (GFSI), which maintains a scheme to benchmark food safety standards for manufacturers. Today, this can be solved by the opportunity to have an extra "layer" of good manufacturing practices related to food, resulting in the FSSC 22000 Food Safety System Certification, a framework for effectively managing your organization's food safety responsibilities that is fully recognized by the GFSI. In the near future, the same opportunity will be there regarding livestock feed.

To maintain ISO 22000's importance for the food industry, it would be fantastic to have similar appendices for sustainability and an ethical approach, resulting in a basic standard and a wide range of possibilities to design an integrated system for the company.
ISO has a huge advantage in being internationally known and, hopefully, the organization will take on the challenge and make it easier for more companies all over the world. ■

Photo : KMC

Cultivating growth in Nigeria

by ***Osita Anthony Aboloma,*** *Director-General/Chief Executive of SON*

Agricultural products are the base of the Nigerian economy, supplying food for the Nigerian people as well as valuable cash crops for export to other countries. These days, the agricultural sector is developing fast, and standards are being used to unleash the potential of the agri-food industry.

The global food security challenge is straightforward : by 2050, the world must feed 9.7 billion people. That means the demand for food will be 60 % greater than it is today. The United Nations has set ending hunger, achieving food security and promoting sustainable agriculture as the second of its 17 Sustainable Development Goals (SDGs) for the year 2030.

Nigeria has been an avid proponent and early adopter of the SDGs, which were approved by the United Nations in September 2015, and plans and policies are now underway to achieve these goals. Despite a strong reliance on farming and agriculture, linked to 70 % of Nigeria's employment, malnutrition is prevalent in many regions, according to the Sustainable Development Goals Fund (SDGF), a United Nations mechanism providing financial support for sustainability initiatives. Today, Nigeria is placing renewed focus on its agriculture as it seeks to address chronic food insecurity in parts of the country.

Food security and why it matters

Why the urgency ? The obvious reason is that everybody needs food. Without proper nutrition, our body couldn't survive. Yet several reports have indicated that one out of ten people among the 7.6 billion world population goes hungry, and with the world's demographics increasing, this statistic may be even higher.

***Osita Anthony Aboloma**, Director-General/Chief Executive of SON.*

Nigeria is placing renewed focus on its agriculture.

Food security looks at the availability of food and the accessibility of the available food. Prior to the discovery of oil, which channelled funds away from the farming sector, the issue of food insecurity was non-existent ; Nigeria was able to feed its population and export the surplus. Today, despite its vast agricultural potential, the country is a net importer of food.

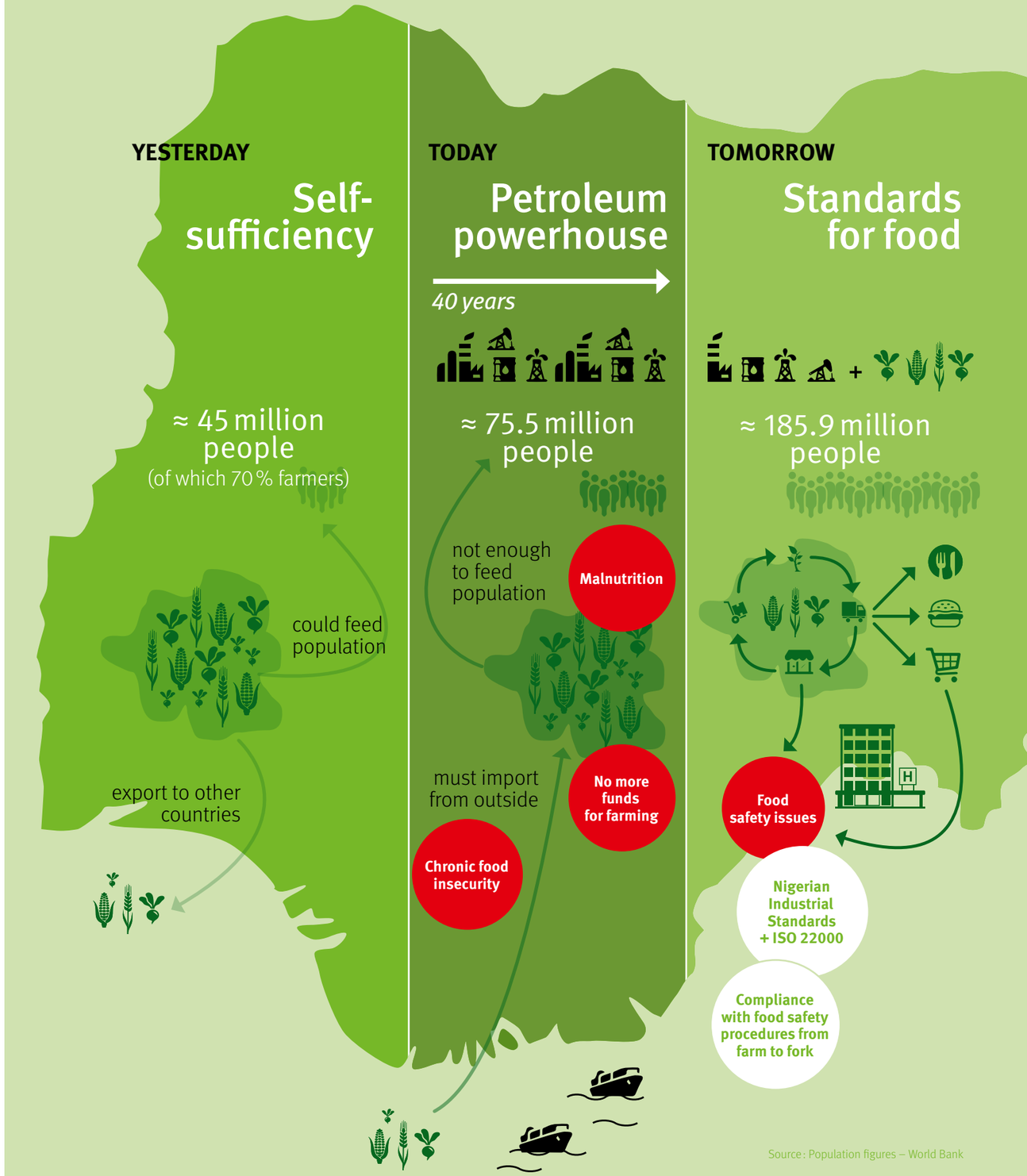
Once the primary source of government revenue and foreign exchange earnings, agriculture in Nigeria has suffered from decades of underinvestment, policy neglect and lost opportunity due to poor planting material, low fertiliser application and a weak agricultural extension system.

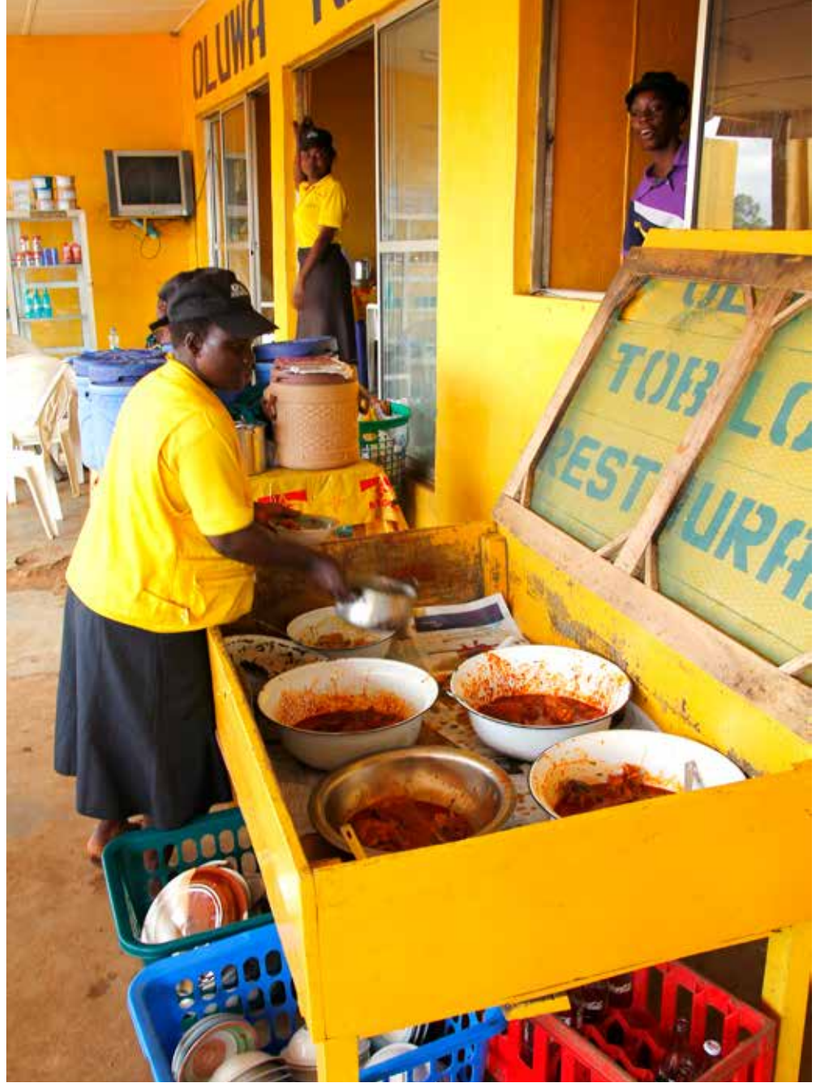
A holistic approach

But food insecurity in Nigeria is not solely tied to underproduction (the country produces 8.41%, 1.09% and 2.85% of roots and tubers, cereal and legumes respectively) though there is an urgent need to step up production. According to a report by the Central Bank of Nigeria (2001), the current rate of increased food production of 2.5% per annum does not measure up with the 2.8% annual population growth.

The rising competition for food has imposed demands for lasting solutions, but what steps are required to truly change the agricultural sector into an engine for transformative growth ? To be sure, cranking up production is no silver bullet for the country's food insecurity ; instead, an all-encompassing approach is what is needed.

Self-sufficiency can only be achieved if crop yields are matched by post-harvest technology, which largely determines the final quality of the product. This includes protecting crops from spoilage and wastage through maximum investment in storage techniques, stimulating production and preventing the hoarding of foodstuffs by agri-food suppliers or local buying agents. In parallel, there needs to be a holistic approach to agricultural research, encompassing various stakeholders in both the public and private sectors in the agricultural value chain.





Safe enough to eat

With a fast-growing economy, a burgeoning middle class and complex supply chains, Nigeria also faces a growing array of food safety challenges. Despite the industry's best efforts, foodborne diseases and food recalls have been regular occurrences in restaurants and food chains across the country. More than half of all foodborne outbreaks in the country are associated with poor food handling by restaurants, banquet facilities, schools and other institutions, according to the Centers for Disease Control and Prevention office in Nigeria.

Food safety involves efforts and compliance with procedures that are put in place to ensure that food is safe, from farm to table. These efforts include ethical safety steps in handling, preparation and storage. Of major importance are the environment and personal hygiene, pest control, removal of waste, and cleaning programmes to minimize the risk of foodborne diseases along the food value chain.

In Nigeria, and all over the world, governments continue to pass laws and regulations to prevent unethical practices that could support the spread of foodborne illnesses from unsafe food production. That's why standards for identifying, preventing, controlling and monitoring foodborne pathogens and microbial parasites are clearly needed to help achieve acceptable quality assurance in the food industry and its value chain.

Addressing the challenges

ISO standards are inevitably the main tool for addressing today's food challenges. They enable safe practices along the global food supply chain, from sound agricultural methods to layout specifications for the end products. This global trend has prompted the Standards Organization of Nigeria (SON), ISO member for the country, in collaboration with its stakeholders, to set limits and requirements that are geared towards sustaining food quality and global best practice.

Of the 50 000 standards developed by SON, some 5 000 are related to food. At SON, we review existing food standards, develop new ones and evaluate areas of contention surrounding new market needs. But regulation is only as good as the resources available to investigate and enforce it, so Nigerian Industrial Standards allow for traceability via labelling, proactive food safety systems and regulatory compliance.

Action by all

Whether it's food security or nutrition, concerted efforts are needed to elicit change, from multinational corporations to individuals who transport, store and sell food. Take, for instance, food security. A lot of effort is being put into addressing food safety challenges, such as foodborne pathogens, spoilage organisms and their toxins. For this reason, many food companies in Nigeria are now using ISO 22000 for food safety management systems and adopting the Hazard Analysis and Critical Control Points (HACCP), a food production monitoring system aimed at preventing contamination at the earliest stages. What's more, manufacturers and food industry experts continue to curb inordinate practices such as the use of low-quality and raw materials, undeclared additives and food fraud.

A unified food quality and safety system is needed – particularly in countries with weak and fragmented food control systems – to achieve good-quality food that's safe for consumption. But much more remains to be done. There is a need to address emerging viruses and antimicrobial resistance organisms, develop improved methods for identifying genetically modified organisms and increase the effectiveness of compliance along the food chain.

While many hurdles still need to be overcome, Nigeria's food opportunities look bright. Despite the setbacks, the country's agricultural sector is still considered to be the strongest and most developed branch of its economy. Nigeria's diverse climate, which varies from tropical to subtropical, makes it easy to grow almost all crops in the region. And with ISO standards and SON's work with national agencies, the country's products are poised for competitiveness in local and international markets. ■

Many food companies in Nigeria are now using ISO 22000.

ARTIFICIAL INTELLIGENCE
COMES OF AGE

Artificial intelligence (AI) is poised to unleash the next wave of digital disruption and companies should prepare for it now, according to the McKinsey Global Institute report "Artificial Intelligence: The Next Digital Frontier?".

Standardization work is now underway to support AI and its applications, with a new international subcommittee formed especially for the task. Joint technical committee ISO/IEC JTC 1, *Information Technology*, subcommittee SC 42, *Artificial intelligence*, is intended to serve as the focus for ISO/IEC JTC 1's standardization programme on AI as well as provide underlying support to other committees.

AI applies to a variety of sectors where standardization is of high relevance: smart manufacturing, robots, autonomous cars, virtual reality, healthcare, interactive speech interfaces, visual recognition, data analysis/manipulation, home appliances, cyber security or spatial programming. Standardizing AI will lead to a new era of growth because companies are going to make important investments in AI solutions and need assurance that they can continue to evolve those systems in the future. Challenges identified so far refer to the deployment, interoperability, scalability, safety and liability of AI, thus providing the rationale for standardization.

The inaugural plenary meeting of ISO/IEC JTC 1/SC 42 took place in April 2018, in Beijing, China. The secretariat of the subcommittee is held by ANSI, the ISO member for the US.

CONFORMITY ASSESSMENT IN MEXICO

ISO's Committee on conformity assessment (ISO/CASCO) held its 33rd plenary meeting in Mexico City this year. The annual session, which took place on 25-26 April 2018, was co-hosted by DGN, ISO's member in Mexico, and the Entidad Mexicana de Acreditación (EMA), and brought together some 90 representatives from 40 CASCO P-members and 11 liaisons.

Delegates valued the presence of ISO Secretary-General Sergio Mujica, who took this opportunity to update the conformity assessment world on the latest developments in the ISO Strategy and to meet with senior Mexican government officials.

The event closed with a workshop on disaster risk management, which addressed the role of standards and conformity assessment in such areas as natural catastrophes, risk management and business continuity planning. In a series of meaningful interventions, national and international speakers presented the current trends in disaster risk reduction, the challenges ahead and the role standards can play in disaster risk management. Participants were able to take full advantage of Mexico's experience and expertise in this area, giving discussions a particular focus on the situation in the region.

MANAGEMENT SYSTEMS
FOR EDUCATION

From pre-school to university to adult training, the convergence of media and technology in a global culture is changing the way we learn and challenging the very foundations of education. As the traditional customer-supplier relationship shifts towards more collaborative partnerships to fit our modern lifestyles, so educational providers must adapt to these new ways of working, while still ensuring the highest level of service.

ISO 21001 – the world's first management system standard for the education sector – is intended to meet this challenge by defining the basic requirements of a management system that will help educational providers answer the needs and expectations of their learners. The upshot is a more relevant and personalized learning experience, ultimately leading to better achievement outcomes.

Developed by project committee ISO/PC 288, which develops management systems specific to educational organizations, the new International Standard focuses on the particular interaction between an educational institution, the learner and other customers. And by disseminating practices that are applicable to learning service providers across the board, ISO 21001 is expected to help build a stronger education sector, with positive ripple effects on innovation and the economy.

CONSUMER PROTECTION
IN THE DIGITAL SPACE

Indonesia played host to ISO/COPOLCO's 40th plenary meeting, which took place on the island of Bali from 7 to 10 May 2018. The event centered around the workshop "Consumer protection in the digital economy", which aimed to explore how standards may complement data protection legislation while helping consumers reap all the benefits technology can provide, such as greater choice and improved delivery of goods and services.

Even as new EU regulations come into force that oblige companies to protect personal data by restricting the way they are collected and used, over 150 local and foreign experts gathered to discuss the impacts of privacy measures, artificial intelligence, the sharing economy and legislation on the online consumer experience.

As ISO's Committee on consumer policy, COPOLCO proposed a standardization solution with a new project committee for consumer protection. ISO/PC 317, *Consumer protection : privacy by design for consumer goods and services*, is set to develop an International Standard on preventive measures that ensure consumer privacy is built into the design of goods and services from the outset.

The standard will serve manufacturers of digitally connected consumer goods, mobile application developers and online service providers – and help consumers claim back control over the use of their data.

Photo: SAC

***Tian Shihong**, Administrator of SAC, ISO's member for China.*

BIG DATA TO BEAT POVERTY

In May 2018, Guizhou Province became the hub for China's big data industry, gathering global tech giants and government officials at the Forum and Exchange Workshop on Standardization of Big-Data-Enhanced Poverty Alleviation, which ran ahead of the China International Big Data Industry Expo 2018.

China, one of the world's most populous countries, has been successful over the years in reducing extreme poverty, particularly in rural areas, through its national strategy for targeted poverty alleviation. Big data is seen as a driving force for development in both traditional and emerging sectors of the Chinese economy, with the rapid growth of data services, intelligent manufacturing and e-commerce.

Poverty alleviation is an area where standards can make a real difference by imposing a more rational and targeted response. Attending the forum, Mr Tian Shihong, Administrator of SAC, ISO's member for China, advocated the integration of big data and standardization as the way forward to lift more people out of poverty by the year 2020. The aim is that by using standards to make big data analytics that work, we can develop a more accurate picture of poverty around the world, helping poorer people to prosper.

ISO 45001 PROMOTED
IN THE ARAB REGION

ISO 45001, *Occupational health and safety management systems – Requirements with guidance for use*, is designed to help organizations around the world reduce workplace illness and injuries. Just two months after its launch, ISO's Capacity Building Unit brought together 33 participants representing a variety of stakeholders from 11 countries in the Arab region to receive training on the new standard.

Representatives from ISO members, governments and the private sector discussed the rationale and benefits of an occupational management system, ways to successfully implement ISO 45001, and the standard's integration with other management systems such as ISO 9001 and ISO 14001. Participants from different cultural backgrounds valued the interactive approach and exchanges on workplace health and safety and the effective use of management standards.

Hosted by INNORPI, ISO's member for Tunisia, the workshop was held within the framework of the MENA STAR Project, ISO's initiative to strengthen institutional infrastructure on standards and regulations in the Middle East and North Africa, funded by the Swedish International Development Cooperation Agency (Sida).

What's really on yo ur plate

by Robert Bartram

The discovery of horsemeat in processed beef products sold by a number of supermarket chains in early 2013 sent shockwaves across the food industry. It has also inspired a stricter food testing regime and a new area of standardization. So how did the scandal unfold and what is being done? Five years on, we look at how standards are helping to tackle food fraud.

The Food Safety Authority of Ireland (FSAI) was becoming suspicious. In 2012, officials had begun to notice that meat being sold in supermarkets and elsewhere was much cheaper than it should have been. They felt obliged to initiate investigations, undertaking a number of tests. Likewise, in the UK, the Ministry of Agriculture, Fisheries and Food had been looking into meat adulteration for some time and suspected that something untoward was taking place. Even so, the FSAI got there first. Eventually, it found that horsemeat was being added to beef burgers sold in Irish and British supermarkets. Public outrage was palpable.

The problem was twofold. Firstly, there was the simple matter of choice: shoppers were not expecting to eat horsemeat and were quite naturally consuming it in the belief that it was something else. Secondly, and perhaps more straightforwardly, consumption of this particular horsemeat constituted a health hazard. The horsemeat that had been mixed in with other forms of meat was not destined for human consumption and some horses had been treated with a drug – phenylbutazone – that was never supposed to enter the human food chain.

Thankfully, the FSAI concluded that the level of drugs they found never put consumers at risk. However, the meat had not undergone proper veterinary quality control or microbiological assessment and could therefore have posed a significant health risk to consumers. So, the two offending factors – namely, freedom of choice and drugs for animal consumption only – made it clear that steps had to be taken to prevent such a crisis from recurring.

Getting away with it

Meat, like the vast majority of products, is traded across international borders. Tracking such shipments is by no means a simple task and one of the reasons investigators are still not sure how long the adulteration process had been taking place. A great deal of meat was confiscated from abattoirs and meat-processing facilities around Europe, but how much, ultimately, was in circulation still remains a mystery. Indeed, meat adulteration is still taking place today. As of October 2017, according to a recent study[1], "the economically motivated adulteration incidents database till date shows about 7.3% [of] cases of food adulteration to fall under the meat and meat products category".

"One important question," says Bert Pöpping, Vice-President of the International Association for Monitoring and Quality Assurance in the Total Food Supply Chain (MoniQa) and a long-term observer of ISO's work, "is why the criminals got away with it without being discovered." Part of the problem in identifying meat adulteration – and thus why this criminal behaviour went unnoticed for so long – is the nature of the testing regime.

At its simplest, tests are undertaken for elements that are expected to be present, not for those that should not be. With fruit, for instance, tests are carried out for a particular pesticide that may well be present in certain crops. Likewise, tests are performed for specific drug residues in chicken or beef, but if some illegal element hasn't been used for a long time and is not being tested for, there would be no positive reading.

This is further complicated by the similarity in texture between horsemeat and beef meat and the fact that, because it's leaner, horsemeat is healthier and is comparatively easy to add to the beef. Finally, in this particular case, budget constraints undoubtedly meant that not all possible tests could be undertaken. Indeed, tests are a risk-based assessment and generally tend to be for the highest risk only.

1) *Global Meat Speciation Testing Market – Growth, Trends and Forecasts* (2018–2023): **https://www.researchandmarkets.com/research/nw8xkr/global_meat**

Fighting food fraud

And so the inevitable question arose, namely how, despite these challenges, the international community could prevent fraudulent meat adulteration from taking place in the future? There has been a Codex standard for some time, but it has long been felt that this does not go far enough. Produced by the Codex Alimentarius Commission, a joint intergovernmental body of the Food and Agriculture Organization of the United Nations (FAO) and the World Health Organization (WHO) to protect the health of consumers and ensure fair practices in food trade, the Codex standards are broad. They include species identification for plants and fish, but often don't go further than this, especially with meat speciation.

More was clearly needed to tackle food fraud and this is where ISO standards come into play. As Ray Shillito, who is both Chair of the ISO technical subcommittee on biomolecular testing methods (ISO/TC 34/SC 16) and Chair of the US technical advisory group, recounts: "The initial impetus for the creation of a standard for meat came from Iran." The Iranian government was concerned that donkey meat was being substituted for halal meat and realized they could not monitor the meat satisfactorily without international support.

The central challenge in creating a standard – the challenge for ISO – is to come up with an agreed method used by all countries for the purpose of realizing comparable results. Standardization is crucial because, apart from anything else, when negotiating a trade contract, a clause can be inserted that states that the product has been tested according to an ISO standard. This means that buyer and seller are exactly on the same page. "And if there is a dispute," points out Shillito, "it can be resolved under World Trade Organization (WTO) rules."

At this point, process becomes vital. The authorities must therefore attempt to agree upon a method that achieves harmonization across all countries involved. Existing methods for detecting the species composition of raw meat depend on protein analysis and these proteins may be denatured on processing and heating. Hence, consensus must be found on new laboratory tests. For instance, a DNA methodology could be deployed or a different set of protein-based methodologies.

With this in mind, within the relevant subcommittee – in this case ISO/TC 34/SC 16 – a working group (WG 8) relating to meat speciation was formed in September 2014. It will put together a document based on consultation with a pool of international experts and submit it to the committee. This sounds very simple, but isn't always. Thankfully, says Shillito, in the case of meat adulteration, it has gone reasonably well.

Agreement on a standard will be the most vital building block.

Settling on specifics

The devil, however, is in the detail. Different countries may be talking about different things, so the text has to be "globally relevant". The working group cannot be "inspired" by one country or region that wants to push its standards on the rest of the world. Agreement is essential quite simply because this document sets out the basic requirements and definitions. It will detail the terminology to be used and define the scope of the standard, including the test method.

One major challenge is how the results should be expressed. Meat consists of muscle, sinew and fat. Yet all three have different levels of DNA. How then is a percentage to be conveyed? Animals contain many different tissues, which contain different amounts of DNA and, in most cases, DNA is what is sought. Another technical challenge is ensuring that the target is specific to the species and is expressed in all normally found versions of that species. A further factor is how the meat is prepared; for instance, if the meat has been ground, this will need to be taken into account.

As both Pöpping and Shillito acknowledge, methods for testing meat are only just developing. In fact, before the horsemeat scandal blew up, there was no real standardization at all. Moreover, until recently, the methods for testing horsemeat were so unclear that the threshold was put at 1%. It simply wasn't feasible to place it at "0.01% horsemeat", which would have meant a much higher detection rate.

One way around this – indeed, one of the major changes in the move towards standardization – is that tests are no longer undertaken simply for elements that are expected to be present. As Pöpping says: "There is currently a move away from targeted testing – from looking at horsemeat [and asking] 'is it there, yes or no?' – to a method that establishes what kind of meat the product consists of." This in itself will be a challenge for standardizing bodies because no institution to date has standardized the non-target methods.

Food for thought

From this point, agreement still needs to be reached by all countries involved. Questions and comments will naturally be raised, followed by a lengthy amendment process until everyone agrees upon the final method.

So, when will a standard for meat testing finally be agreed? Our experts concur as to the timeline, and both are optimistic. But one thing is for certain, an ISO standard on meat adulteration cannot come soon enough. Agreement on a standard will be an achievement in itself and the most vital building block in the prevention of criminal meat adulteration worldwide. And for that, we should all be grateful. ■

Fighting FOOD FRAUD

In early 2013, horse DNA was identified in beef products sold in several supermarket chains. Five years on, work is underway on a new ISO standard for meat speciation testing.

HOW THE SCANDAL CAME TO LIGHT

IRELAND

On 16 January 2013, Irish food inspectors announced that they had found traces of equine DNA in frozen beef burgers sold by leading supermarket chains – 10 million burgers were taken off shelves by retailers.

UK

In the UK, ready meals such as lasagne, spaghetti bolognese and beef burgers were recalled after tests found they contained horsemeat.

FRANCE

Much of this food was traced back to 750 tonnes of mislabelled horsemeat from a French meat processing company.

ROMANIA

An investigation found the horsemeat used originated from Romanian slaughterhouses.

WHAT'S AT STAKE ?

The public was outraged as veterinary painkiller "bute" (phenylbutazone) – banned from the human food chain – was found in horse carcasses. Health experts said the issue was one of food fraud rather than food safety.

Painkiller found in horse carcasses

Police investigations across Europe

Conclusion : Food fraud /criminal

Financial gain : Horsemeat = cheaper

A STANDARD SOLUTION

Call for an ISO standard on meat testing led to the creation of working group WG 8 on meat speciation within **ISO/TC 34/SC 16**.

TO TEST OR NOT TO TEST...

THE PROBLEM : Existing test methods involve testing for elements expected to be present (i.e. a specific meat species or a specific drug).

THE SOLUTION : Urgent need to develop new test methods to analyse what kind of meat a product consists of.

One of the most powerful methods relies on testing for the presence of DNA in food, for example horsemeat in a product labelled "beef". An alternative approach to species detection is to measure the sequence of proteins, which are dictated by the sequences in DNA (based on differences in a key meat protein).

Source : FST Journal (30 May 2017), Institute of Food Science and Technology.

It's *only* natural

by Barnaby Lewis

A growing awareness about what we eat, evidenced by changes in consumer habits and the rise of picture-perfect plates on social platforms, points to an increasing demand for natural foods. That prompted a global network of ingredient suppliers and food manufacturers to start an interesting conversation about exactly what "natural" means.

The adage that "we are what we eat" seems to have taken on an unexpected significance in a shrunken world. On the upside, the diversity of foods that we can now enjoy is staggering. Millennials and Generation Y (5- to 20-year-olds) are growing up to expect ethnically diverse foods that are also convenient and reasonably priced. They can find them in supermarkets, cafeterias and vending machines, as suppliers and manufacturers have responded to a world where tastes have become internationalized and lifestyles are faster-paced.

At the same time, a generation that is hyperconnected and more aware of its impact on the planet, and the impact of the environment on its own health, is more likely to be concerned about where food has come from, how it was produced, and what it contains.

Fortunately, consumers can reassure themselves that the vast majority of food is produced to higher standards than ever before, but there is nonetheless a downside to globalized food. This is simply its commoditization, driven by the need to move raw goods quickly, and the homogenization of ingredients necessary to produce foods that are predictable, stable and easily processed.

The perils of eating global

As food ingredients are stripped of their local cultural associations, recipes and production techniques, they start to resemble industrial components. Additionally, in such circumstances, a lack of clarity over basic terminology leaves an open door to costly misunderstandings and unscrupulous operators. As a result, the sheer scale of global food movement has been abused by criminals trying to sell substandard or fake food ingredients.
The extent of this type of fraud is unknown but, amplified through social media, the impact on consumer consciousness has been substantial. It's made suppliers aware of how fragile trust is, and has given rise to a demand for a level playing field where suppliers describe their products in a way that is transparent and, above all, clear.

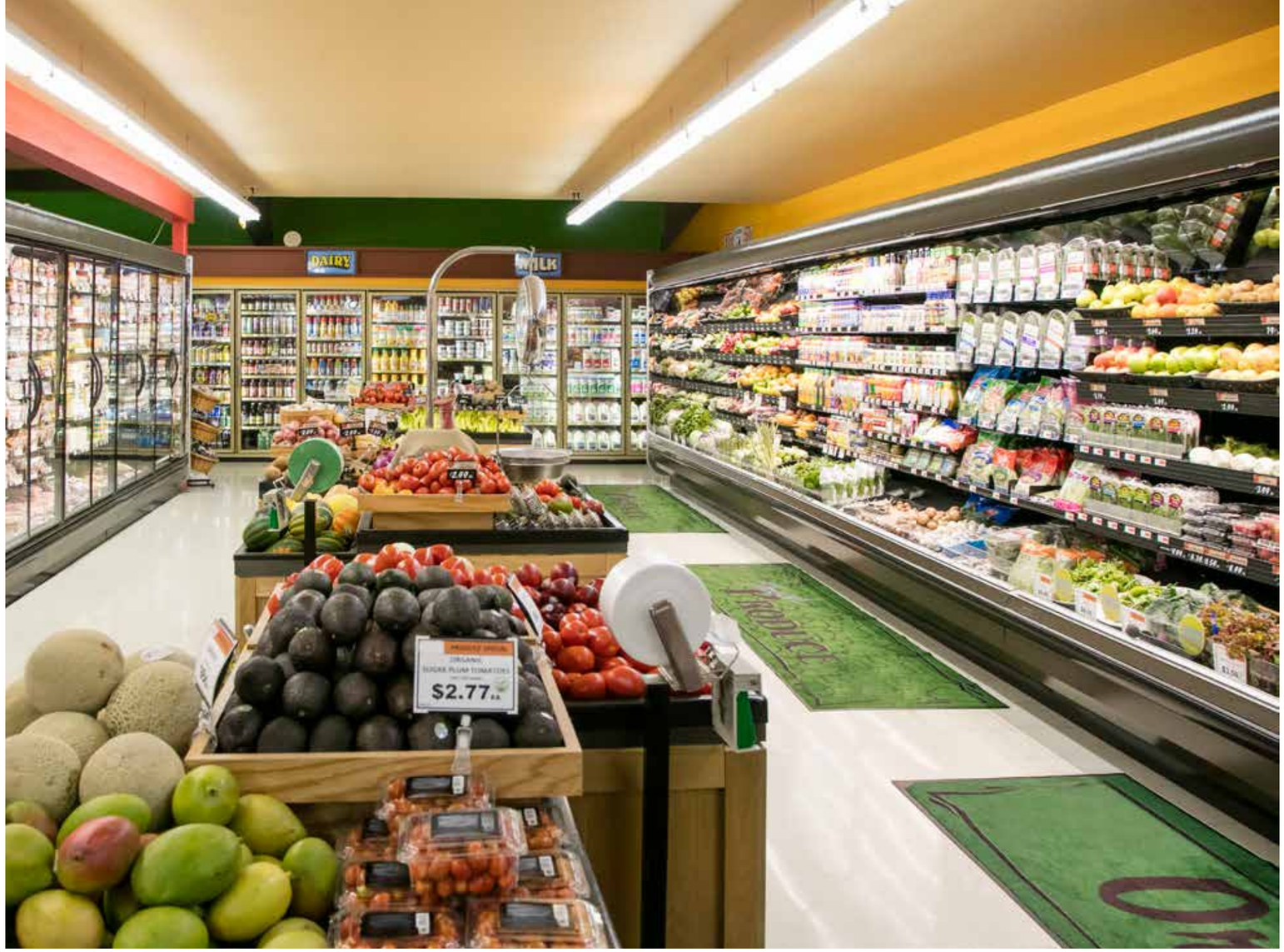
At the table together

What was required was a common understanding among ingredient suppliers and their customers, the food manufacturers, as to what constitutes "natural". This would allow manufacturers to make their own subsequent claims about the finished product with the certainty to justify consumer confidence. In other words, there was a clear need for an ISO standard.
Developed by ISO/TC 34, the ISO technical committee for food products, a technical specification was published in 2017. ISO/TS 19657, *Definitions and technical criteria for food ingredients to be considered as natural*, is a concise document that provides a clear terminology. It brings much needed clarity to the tangled web of processes and logistics that define today's global food supply chains.
A little over half a year has passed since the standard was published and *ISOfocus* took the opportunity to catch up with one of the experts who took part in its development, to ask him what benefits he expects, and how standards can influence the challenges and trends define our future relationship with food.

The impact on consumer consciousness has been substantial.

From chemical engineer to standardizer

Dominique Taeymans is a food regulatory consultant whose career stretches across four decades. A Belgian national now living in Switzerland, he was a professor of food engineering, who still teaches today, and has worked for global food giant Nestlé. Dominique also contributed to the harmonized EU food regulatory framework as well as the international Codex Alimentarius standards. Bringing academic, commercial and regulatory experience, he was a welcome addition to the team of experts assembled by ISO/TC 34, whose secretariat is held jointly by AFNOR, the ISO member for France, and ISO's Brazilian member, ABNT.
Considering that the standard's goal is to enable business-to-business (B2B) communication, I asked how non-specialists might understand what criteria are taken into account when a food is described as natural? "There are basically three criteria that qualify a food as natural," Dominique begins. "The first element is its origin: does it come from nature?" Meaning that the first part of the definition excludes things that have been chemically synthesized or exist only in laboratories.
I asked Dominique how that might impact future agricultural trends, such as a move toward cellular agriculture, where products more or less identical to meat or egg protein can be grown in laboratory conditions. "For me, that would not be a natural product," he told me, "it couldn't be labelled that way." But wouldn't that potentially pose a barrier to new technologies that could help address world hunger? "No, the technical specification does not make judgements about what types of agriculture or products are good or bad, or necessary. It simply gives a common way of defining what is natural, where that's an important characteristic of the product."



"The second part is that it shouldn't have been chemically processed", meaning that industrial-scale chemistry isn't used to fundamentally alter the ingredient, "although food additives are allowed, provided that they themselves adhere to the fundamental natural principle".
Addressing the most important consumer concern, that of food safety, is the third criterion, which applies an intelligent degree of tolerance to defining a natural ingredient: "that it must comply with all local regulations relating to food safety and that, where that cannot be realistically achieved using natural processes, then alternatives can be used, but only when they don't alter the basic nature of the food itself".

Different tongues, different tastes

While diverse culinary heritages mean that consumers in each country may have very different ideas about what they, as individual cooks and consumers, expect natural products to contain, or not to contain, global operations that ship ingredients to manufacturers around the world need to have a shared basis for conversation.

There was a clear need for an ISO standard.

What companies can say to consumers about their food products varies almost as widely as the taste preferences of each nation and is generally quite heavily regulated. Such regulation consists of a mix of cultural conventions and local legislation, and where it is standardized to some degree, that's taken care of by the Codex standards that set clear rules for what should appear on labels of finished goods.
Those consumer labelling standards also cover organic products, a category that would likely interest buyers of natural foods. Is there a potential for confusion between the two terms? Hopefully not, according to Dominique: "organic" is a definite and well-regulated category – things produced by a certain way of farming – whereas "natural" is more of a claim, it's broader. Many "organic" products should qualify as "natural", but not the other way round; "natural" products are not automatically "organically grown".

The ingredient of good decisions

It wasn't until ISO/TS 19657 that there was a way for manufacturers to assess their ingredients and potentially make that claim on an equal footing with each other. The need for a B2B standard reflects the growing complexity of the massive global network of producers, suppliers and manufacturers that keep our supermarkets stocked with the products that we expect.
Consider that a package of noodles on a supermarket shelf displays only one label with information about its composition and nutritional value. Yet the main ingredient (perhaps, yellow wheat noodles) may itself comprise multiple ingredients, each potentially sourced from numerous suppliers or origins.
If it feels like it's a difficult job, as a consumer, to make good decisions about what you put on your plate, you can imagine that the task becomes exponentially harder as you consider food atomized to its fundamental building blocks.
So while particle physicists can enjoy inventing terms as the need arises (from "gluons" to the ironically unimaginative "very large telescope"), suppliers of food have to find clear definitions for terms that have been in common use for decades. Thanks to ISO standards, everyone can now join in the conversation about how, and what, we eat. ■